

Abstract

TITLE: The Masses of High-Z Sub-mm Luminous Galaxies Through Clustering

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We have used the Submillimetre Common-User Bolometer Array (SCUBA) detector on the James Clerk Maxwell Telescope (JCMT) to measure bright sub-mm emission associated with a recently discovered extensive ($>100/h$ kpc) and highly luminous, 'blob' of Ly-alpha emission at $z=3.09$. The blob lies within a known large overdensity of optical sources in the $z=3.07-3.11$ range, and is centered on a locally overdense peak within this region. The best explanation for the copious sub-mm emission is a dust obscured continuum source, which may produce the ionizing flux for the Ly-alpha cloud. Cooling gas explanations are plausible but excessively complicated, and the 450/850 micron ratio rules out a significant fraction of the signal arising from the Sunyaev-Zel'dovich increment. At least two additional ~ 10 mJy sub-mm detections in the SCUBA map, with a surface density significantly higher than in blank field surveys, suggests that they may be associated with the $z=3.09$ structure. A SCUBA 'photometry' observation of a second nearby Ly-alpha blob tentatively detects a weaker sub-mm counterpart.